

CLAIMS

1. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, said method comprising:

extracting phonetic information regarding said language;

defining, based on said extracted information, phonological and phonetic units associated with said language;

identifying variations in said language;

developing a maximal set based on said defined phonological units, phonetic units, and identified variations in said language, and

reducing said maximal set to a minimal set of phonemes and allophones, thereby providing for a compact model for acoustically transcribing said language.

2. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 1, wherein said step of extracting information further comprises:

identifying terminological problems associated with said language;

identifying transcription problems associated with said language;

extracting all phonological and phonetic units associated with said language,

and

selecting a representative symbol for the transcription alphabet.

3. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 1, wherein said maximal set comprises any of, or a combination of: phonemes, allophones, rules governing the selection of allophones, a set of examples, and transliteration symbols.

4. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 1, wherein said step of reducing said maximal set further comprises reducing an automatic speech recognition phonetic set.

5. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 4, wherein said step of reducing an automatic speech recognition phonetic set further comprises the use of diacritics, graphemes, and allophones.

6. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 1, wherein said step of reducing said maximal set further comprises reducing a text-to-speech phonetics set.

7. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 6, wherein said step of reducing an text-to-speech phonetics set is accomplished by using allophones and adding symbols representing the phoneme to be geminated.

8 A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 1, wherein said transcription alphabet is in compliance with the International Phonetics Alphabet (IPA).

9. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 1, wherein said language is any of the following: modern standard Arabic (MSA), classical Arabic, or colloquial Arabic.

10. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 1, wherein said phonetic information is extracted over a network.

11. A method for determining a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 2, wherein said network is any of the following networks: local area networks (LAN), wide area networks (WAN), Internet, HTTP-based networks, or wireless networks.

12. A voice control system utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, said system comprising:

a computer system;

a microphone, said microphone interfacing with said computer system, said microphone capable of receiving voice input in said language,

a multimedia kit including full duplex sound card, said multimedia kit interfacing with said computer system, and said multimedia kit receiving said voice inputs from said microphone, and

said computer system receiving said voice input from said multimedia kit and phonetically analyzing said voice inputs using a stored compact set of phonetic alphabets thereby enabling translation of voice-to-text based on said stored compact set of phonetic alphabets.

13. A voice control system utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 12, wherein said multimedia kit further comprises a built-in automatic speech recognition (ASR) utility.

14. A voice control system utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 12, wherein said

multimedia kit recognizes human voice and interprets it into corresponding actions without being speaker dependent.

15. A voice control system utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 14, wherein said speaker dependant includes gender or age.

16. A voice control system utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 12, wherein said compact set of phonetic alphabets is accomplished using diacritics, graphemes, and allophones.

17. A voice control system utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 12, wherein said compact set of phonetic alphabets are compliant with the International Phonetics Alphabet (IPA) standard.

18. A voice control system utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 12, wherein said language is any of the following: modern standard Arabic, classical Arabic, or colloquial Arabic.

19. A voice control method utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, said method comprising:

receiving voice inputs in said language via a microphone;

phonetically analyzing said received voice inputs using a computer-based system,

and

said computer-based system analyzing said voice input using a stored compact set of phonetic alphabets, thereby enabling translation of voice-to-text based on said stored compact set of phonetic alphabets.

20. A voice control method utilizing a compact model to transcribe a language acoustically based on well-defined basic phonetics, as per claim 19, wherein said compact set of phonetic alphabets is accomplished using diacritics, graphemes, and allophones.

L.Name	A. letter	Sound Features	New Alphabet	Examples	Transcription
Alif	Ā	glottal plosive -	C	ĀōĪōāōÉ	Ce.dIl.le
		epiglottal fricative +	0	āōĀōĐōā	mu.0e4.4In
Ba	Ē	bilabial plosive +	b	ĒóÇōōāóÉ	b1.8l.le
	Ēø	geminated bilabial plosive +	B	ĒōāōĒōā	te.ne.Be.0e
Ta	Ē	alveolar plosive -	t	ĒóĪúāóĪ	teh.l3l
	Ēø	geminated alveolar plosive -	T	ÓōĒōóÉ	sl.Te
Tha	Ē	dental fricative -	F	ĒōāóÇāōĪóÉ	Fe.mE.ni.je
	Ēø	gemi ¹ nated dental fricative -	FF	āōβóĒøōŸ	mu.keF.Fef
Jim	Ī	velar plosive +	g	ĪóāúÓóÉ	gel.se
		alveolo-palatal fricative +	5		5el.se
	Īø	Geminated velar plosive +	G	āōĒóÚóĪōā	mu.te.Ve.GIl
			55		mu.te.Ve5.5Il
Ha	Ī	Pharyngeal fricative -	h	ĪóÖóĪó	ha.6A.rA
	Īø	Geminated pharyngeal fricative -	hh	ÖóĪóóÉ	Slh.ha
Kha	Ī	uvular fricative -	x	ĪóāúÓóÉ	xem.se
	Īø	geminated uvular fricative -	xx	ÇáÓøóĪøóÇä	Ces.sex.xEn
Dal	Ī	alveolar plosive +	d	ĪóÚúā	DeVm
	Īø	geminated alveolar plosive +	D	āōĪøó	me.De
Dal	Đ	dental fricative +	4	ĀĐóÇä	CE.4En

	Ðø	geminated dental fricative +	44	ÇáÐøóÇÊöíø	Ce4.4E.tlU
Ra	Ñ	r flap not retroflexed +	r	ÑóáúÓöíó	ram.s3s
	Ñø	alveolar trill +	R	ÑóþóÑøó	Ce.qA.RA
Za	ò	alveolar fricative +	z	ÓóíúÊ	Zejt
	òø	geminated alveolar fricative +	zz	ÍòÐøðáó	xez.ze.na
Sin	ó	alveolar fricative -	s	ÓóÊöíá	se.b3l
	óø	geminated alveolar fricative -	ss	ÇóáÓøóÊúÊ	Ces.sebt
Shin	ó	post alveolar fricative -	c	ÓóÑöðóÊ	ce.ri.ke
	óø	geminated post alveolar fricative -	cc	ÇáÐøóæøóÇÝ	Cec.ce.WEf
Sad	õ	pharyngealised s -	S	Õóáøðöì	SAI.I3
	õø	geminated pharyngealised s -	SS	ÇáÐøóíøóÇĬ	CAS.SA.J1d
Dad	ö	pharyngealised d +	6	ÍóÖóÑó	hA.6A.rA
	öø	geminated pharyngealised d +	7	ÝöÖøóóÊ	fl.7A
Ta	ø	pharyngealised t -	8	øóáóÚó	8A.la.Ve
	øø	geminated pharyngealised t -	9	ÇáÈøðøóÇÑöíøó É	Cel.bA.92.rl.Je
Za	ú	pharyngealised <u>dal</u> +	Z	Úóáøó	ZAI.la
	úø	geminated pharyngealised <u>dal</u> +	ZZ	ÇáÚøóáóÇã	CAZ.ZA.I1m
Ain	ú	pharyngeal fricative +	V	ÚóÑúÖ	VAR6

	ΰ	geminated pharyngeal fricative +	VV	ΆόΌύόέ	Ce.cIV.Ve
Ghain	Ű	uvular fricative +	P	ÇáŎøöÉóÇŰóÉ	CeS.Si.b1.Pa
	Űø	geminated uvular fricative +	PP	ÉóæóŰøóá	te.weP.Pol
Fa	Ý	labiodental fricative -	f	ÇáŰŰóÝúá	Cel.hefl
		labiodental fricative +	v	ÉáűŶöŎűæä	tl.li.vls.jOn
	Ýø	geminated labiodental fricative -	ff	ÇöŎŰÉóűűóÝøó	Cls.te.xef.fe
qaf	Þ	uvular plosive -	q	ÞóŎŰŊ	QASr
	Þø	geminated uvular plosive -	Q	ÍóÞøóäð	ha.QA.Hu
kaf	ß	velar plosive -	k	ßöáøöűóóÉ	kul.li.Je
	ßø	geminated velar plosive -	K	ÉóäóßøóäóÉ	te.me.Ke.net
lam	á	alveolar lateral approximant +	l	íóäóÉøűí	ju.le.B3
	áø	geminated alveolar lateral approximant +	LL	Çááá	CAL.L2X
mim		geminated pharyngealised l +	ll	ÇóáúäöŎűóóäűóűóÉ	Cel.mu.sel.le.ha
	ã	bilabial nasal +	m	ãóŎŰűűí	mes.5ld
nun	ãø	geminated bilabial nasal +	mm	ÇáäðÇäøóÉ	Cel.Hem.me
	ä	alveolar nasal +	n	äóŰóä	ne.Vem
		velar nasal +	N	ÇóäúßóŊó	CaN.ka.ra
ha	äø	geminated alveolar nasal +	nn	ÉóŎűäøóűóűó	ta.San.na.Va
	â	glottal fricative -	X	Ýóäúű	feXd
		glottal fricative +	H	ŰóäðŊó	ZA.Ha.rA
	âø	geminated glottal fricative +	HH	Éóæóäðóóäð	ta.weH.He.me

waw	æ	labio-velar approximant +	W	ĩōæóá	du.wel
	æø	geminated labio-velar approximant +	W	ÇáÊøóáæøĖ	Ce.Te.le.WuF
ya	ĩ	palatal approximant +	j	íóĩúŮðã	jed.Vom
	ĩø	geminated palatal approximant +	J	ÇáÊóĩóĩøðã	Ce.Te.de.Jon
fatha		open mid front	e	ÊóĩúŮðÊóĖ	te5.rl.be
		open front	a	Ůóĩóĩó	SA.da.qa
		low back	A	þóŮóĩ	qA.62
kasra		mid-high mid-front short	i	ÇãäøóÇþöĩ	Cen.n1.qld
		close front	I	Āóáóĩ	Ci.IE
damma		close back	u	ĀðãøóáðóÇĖ	Cum.me.HEt
		open – mid back	o	ÇãŮðŮóĩ	Cel.Po.raf
alif	mid front long		E	ÇãŮðóĖóÇĖ	Cec.ce.bEb
	open front		1	ÇãúĩóÇŮóĖ	Cel.hE.slb
	low back		2	ÇöäúŮðŮóÇá	Cln.fi.S2l
waw	close back		U	ĖóĩðæŮ	te.dUr
	open mid back		O	ĩðßúĖðæŮ	duk.tOr
ya	mid-high mid-front long		Y	ĀóäúĖöĩŮ	Cem.bYr
	close front		3	ŮóĖöĩó	ra.03s

TABLE 2

wegd	æóİúİ
waqt	æóPúÊ
WA6V	æóÖúÚ

(Different symbols that represent short Fatha)

NE.0Im	äÇÆã
N1.qId	äÇPİ
N2.6Ig	äÇÖİ

(Different symbols that represent long Fatha)

TABLE 3

Ben.nEC	ÈóäøóÇÁú
Ra.B3	ÑóÈøöí
8A.lab	ØáÈ
CA.9A.lab	ÇáØøóáÈ

(Different symbols that represent gemination)

TABLE 4 **Phonetic Alphabet for Arabic Speech Recognition System**

English Representation	Arabic Letter	SAKHR Phonetic Symbol	Arabic Example
Plosives			
Hamza	أ	F	آÓĬ
Ba	ب	b	ÉíÊ
Dal	د	d	Ĭáíá
Dad	ذ	d%K	ÖäíÑ
Jim	ج	g	ĬÉá
Kaf	ك	k	βâÝ
Qaf	ق	q	pÉá
Ta	ت	t	ÊãÑ
Ta	ظ	t%K	ØÑíβ
Nazals			
Mim	م	m	ãäÓá
Nun	ن	n	äĬã
Trills			
Ra	ر	r	Ñää
Fricatives			
Dal	ظ	D	ĐäÈ
Za	ز	D%K	Üá
Ain	ع	F7	Úíä
Ghain	غ	R7	Úíä
Shin	ش	S	ÖäÓ
Tha	ث	T	ÈpÈ
Kha	خ	X	ĬÑĬ
Fa	ف	f	ÝÑ
Ha	ه	h	äĬÑ
Ha	ح	h>	ĬÑÈ
Sin	س	s	ÓäÇÁ
Sad	ص	s%K	ÖĬĬ
Za	ذ	z	Öíä
Approximants			
Ya	ي	j	íæã
Lam	ل	l	áæã

Waw	æ	w	æáĭ
Long Vowels			
Alif	Ç	a:	ĬÈÇá
Ya	í	i:	Ĭía
Waw	æ	u:	ÈæÑ
Short Vowels			
Fatha	ó	a	Íãá
Kasra	ö	i	ãÑãÉ
Damma	õ	u	póÑÈ